

CLAIMS

1. A method for analysing a cell sample for cell surface-bound or intracellularly bound analytes, which method comprises the steps of:

(i) providing a solid support having on a surface thereof a plurality of different binding agents immobilized at defined positions on the surface, wherein each binding agent comprises one member of a specific binding pair;

(ii) contacting the solid support surface with a set of different ligands, each ligand comprising a first part capable of specifically binding to a specific analyte selected from cell surface-bound analytes and intracellularly bound analytes of a defined cell type, and a second part which comprises the other member of each specific binding pair, such that each ligand binds through its specific binding pair part to a specific position on the solid support surface;

(iii) determining the amount of binding of each ligand to the solid support surface;

(iv) incubating a cell sample-containing fluid with a set of ligands identical to that in step (ii) to permit the ligands to bind to cell surface-bound or intracellularly bound analytes of cells present in the cell sample fluid;

(v) contacting the cell sample fluid with a solid support surface according to step (i) to permit ligands that have not bound to cell surface-bound or intracellularly bound analytes to bind to the solid support surface; and

(vi) determining the amount of binding of each ligand obtained in step (v) and comparing that binding amount with the amount of binding of the same ligand obtained in step (iii), reduced binding in step (v) indicating the presence of ligand-specific cell surface-bound analytes or intracellularly bound analytes in the cell sample.

2. The method according to claim 1, wherein the solid support surface obtained in step (ii) is regenerated to provide the solid support surface used in step (v).

3. The method according to claim 1, wherein cells and cell fragments are removed from the cell sample before contacting the incubated cell sample fluid with the solid support surface in step (v).

4. The method according to claim 3, wherein the cells and fragments are removed by filtration or centrifugation.

5. The method according to claim 1, wherein each ligand in step (ii) is used at a known concentration, and that the same concentration of each ligand is used in step (v).

6. The method according to claim 1, wherein steps (v) and (vi) are repeated with at least one different cell concentration of the cell sample-containing fluid, and that quantitative measures of cell surface-bound analytes or intracellularly bound analytes are determined.

7. The method according to claim 1, wherein steps (v) and (vi) are repeated with at least one different ligand concentration, and that quantitative measures of cell surface-bound analytes or intracellularly bound analytes are determined.

8. The method according to claim 1, wherein the cell sample contains intact cells.

9. The method according to claim 1, wherein the cell sample contains cells, the membranes of which have been made permeable to ligands.

10. The method according to claim 1, wherein binding to the solid support surface is detected by a label-free detection method.

11. The method according to claim 10, wherein the detection method is based on mass-sensing.

12. The method according to claim 11, wherein the mass sensing comprises evanescent wave sensing.

13. The method according to claim 1, wherein the solid support surface is provided in at least one flow cell.

14. A method for analysing a cell sample for cell surface-bound or intracellularly bound analytes, which method comprises the steps of:

(i) providing a solid support having on a surface thereof a plurality of different binding agents immobilized at defined positions on the surface, wherein each binding agent comprises one member of a specific binding pair;

(ii) contacting the solid support surface with a set of different ligands, each ligand comprising a first part capable of specifically binding to a specific analyte selected from cell surface-bound analytes and intracellularly bound analytes of a defined cell type, and a second part which comprises the other member of each specific binding pair, such that each ligand binds through its specific binding pair part to a specific position on the solid support surface;

(iii) contacting a cell sample-containing fluid with the solid support surface resulting from step (ii) having the ligands bound thereto to permit cells or cell fragments in the sample to bind to ligands on the solid support surface through cell surface-bound or intracellularly bound analytes; and

(iv) determining the binding of cell surface-bound or intracellularly bound analytes to each ligand on the solid support surface.

15. The method according to claim 14, wherein the cell sample contains intact cells.

16. The method according to claim 14, wherein the cell sample contains cells, the membranes of which have been made permeable to ligands.

17. The method according to claim 14, wherein binding to the solid support surface is detected by a label-free detection method.

18. The method according to claim 17, wherein the detection method is based on mass-sensing.

19. The method according to claim 18, wherein the mass sensing comprises evanescent wave sensing.

20. The method according to claim 1, wherein the solid support surface is provided in at least one flow cell.

21. An assay kit for cell characterization, comprising:

(i) a solid support having on a surface thereof an array of different binding agents immobilized at defined positions on the surface, wherein each binding agent comprises one member of a specific binding pair; and

(ii) a set of different ligands, each ligand comprising a first part capable of specifically binding to a specific analyte selected from cell surface-bound analytes and intracellularly bound analytes of a defined cell type, and a second part which comprises the other member of a respective one of the specific binding pairs, such that each ligand may bind through its specific binding pair part to a specific position on the solid support surface.

22. The assay kit according to claim 21, wherein the members of each specific binding pair bind reversibly to each other.

23. The assay kit according to claim 21, wherein the specific binding pairs comprise complementary nucleic acid strands.

24. The assay kit according to claim 23, wherein the nucleic acid strands comprise oligonucleotides.

25. The assay kit according to claim 21, wherein the specific binding pairs comprise hapten/antibody.

26. The assay kit according to claim 25, wherein the specific binding pair part of the ligand comprises a hapten.

27. The assay kit according to claim 21, wherein the solid support surface comprises a sensor surface.

28. The assay kit according to claim 21, wherein the solid support surface comprises a sensing surface of a biosensor.

29. An assay kit for cell characterization, comprising:

(i) a solid support having on a surface thereof an array of different binding agents immobilized at defined positions on the surface, wherein each binding agent comprises one member of a specific binding pair; and

(ii) a set of binding elements, each of which comprises the other member of a respective one of the specific binding pairs and a reactive group that permits chemical coupling of the binding element to a ligand which is capable of specifically binding to a specific analyte selected from cell surface-bound analytes and intracellularly bound analytes of a defined cell type.

30. The assay kit according to claim 29, wherein the members of each specific binding pair bind reversibly to each other.

31. The assay kit according to claim 29, wherein the specific binding pairs comprise complementary nucleic acid strands, especially oligonucleotides.

32. The assay kit according to claim 29, wherein the binding elements comprise haptens.

33. The assay kit according to claim 29, wherein the solid support surface comprises a sensor surface.

34. The assay kit according to claim 29, wherein the solid support surface comprises a sensing surface of a biosensor.